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In re Application of

Ching-Wu Chu,

Application Number

Filed

07/012205 FW 07/300063 2/6/87

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US00705686B1

**(12) United States Patent**  
**Chu****(10) Patent No.: US 7,056,866 B1**  
**(45) Date of Patent: Jun. 6, 2006****(54) SUPERCONDUCTIVITY IN**  
**SQUARE-PLANAR COMPOUND SYSTEMS****(75) Inventor: Ching-Wu Chu, Houston, TX (US)****(73) Assignee: University of Houston-University**  
**Park, Houston, TX (US)****(\*) Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 785 days.**(21) Appl. No.: 07/032,041****(22) Filed: Mar. 26, 1987****Related U.S. Application Data****(63) Continuation-in-part of application No.**which is a  
continuation-in-part of application No. 07/006,991,  
filed on Jan. 26, 1987, now abandoned, which is a  
continuation-in-part of application No. 07/002,089,  
filed on Jan. 12, 1987, now abandoned.**(51) Int. Cl.****C04B 101/00** (2006.01)**H01L 39/12** (2006.01)**H01B 12/00** (2006.01)**(52) U.S. Cl.** ..... **505/125; 505/126; 505/490;**  
505/500; 505/780**(58) Field of Classification Search** ..... 252/520,  
252/521, 518; 423/263, 593; 501/104, 108,  
501/123, 126, 135, 152; 29/599; 420/901;  
428/930; 505/100, 125, 126, 779, 780, 490,  
505/500

See application file for complete search history.

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\* cited by examiner

**Primary Examiner**—Mark Kopec**(74) Attorney, Agent, or Firm**—Akin Gump Strauss Hauer & Feld LLP; Charles M. Cox**(57) ABSTRACT**Described is a superconducting composition comprising an oxide complex of the formula [L<sub>1-x</sub>M<sub>1-x</sub>]<sub>2</sub>A<sub>2</sub>O<sub>7</sub> wherein L is lanthanum, lutetium, yttrium, or scandium; A is copper, bismuth, titanium, tungsten, zirconium, tantalum, niobium, or vanadium; M is barium, strontium, calcium, magnesium or mercury; and "a" is 1 to 2; "b" is 1; and "x" is a number in the range of 0.01 to 1.0; and "y" is about 2 to about 4. The oxide complexes of the invention are prepared by a solid-state reaction procedure which produces an oxide complex having an enhanced superconducting transition temperature compared to an oxide complex of like empirical composition prepared by a coprecipitation—high temperature decomposition procedure. With an oxide complex prepared by the solid-state reaction of the invention a transition temperature as high as 100°K has been observed even under atmospheric pressure.**15 Claims, 5 Drawing Sheets**